

munication could, and almost certainly did, take place in the following way.

The crest of the spur of the Ust Urt plateau, which formed the southerly limit of the now desiccated gulf Abougir, is about fifty feet above the present level of Lake Aral. Once filled up to that level, if the lake continued to receive more water than was evaporated from its surface, *i.e.* more than 3,400 cubic yards per second, an overflow would take place into the country now traversed by the channel called Uzboy, which has a gentle slope to the south of less than four inches per mile.* It is probable that the lands stretching from Uzboy westwards to the foot of the elevations encircling Karaboogas would have been flooded. Perhaps at this high level Aral may have discharged at its extreme north-western point also, and have flooded the country stretching round the northern foot of Ust Urt. On the north, it may have topped the low transverse ridge which now divides the northern and southern drainage. And if, in addition, the level of the Caspian was at that time some few feet higher than it now is, its waterspread would have advanced to meet the overflow from Aral, and Ust Urt and its narrow southern spurs, which run along the east shore of the Caspian, would have been isolated among marshes and shallow water. The classical geographers would thus have had ample grounds for the description they have handed down to us of the Sea of Hyrcania, as well as good reason for giving but a single name to the waterspread of the sea, since the separation of its basin from that of Aral would have become evident only after the fall of the level of this lake.

Until the separation became evident, this Aralo-Caspian Sea would have presented all those aspects which history tells us it has had. As the level gradually fell in Lake Aral, the inundated ground would become drier; and in the first century of our era, as reported by the Chinese, the banks of the "Western Sea" would have been surrounded with great marshes. It may be doubted whether the Palus Oxiana of Ptolemy and the Oxian Marsh mentioned by Ammianus Marcellinus should be placed in this locality; but there is more probability that the Sinus Scythicus of Mela is identical with Lake Aral and its former southern marshy appendage, of which Uzboy is the axis.

The waterspread of such an Aralo-Caspian Sea would have added an area of about 70,000 square miles to the limits of the Caspian of to-day; and the evaporation from such a surface would have absorbed a supply from the rivers then feeding Lake Aral of about 7,000 cubic yards per second; in other words, a volume of water three-and-a-half times greater than that discharged by the mouths of the Amú and the Syr together at the present time.

If it be considered that at this epoch the greater, if not indeed the entire volume of the Oxus passed directly westwards into the Caspian, the difficulty is somewhat increased in finding an answer to the important question, where the large volume of water mentioned came from?

However, it is very probable that the Tchuy and the Sary Su discharged at that time into Lake Aral, instead of losing themselves, as they now do, in the sand. The Kenderlik of the great Russian chart, as well as the Demous, the Baskatis, and the Araxetes of the classics, together no doubt with many other minor streams, have disappeared in these countries, though their waters formerly would have fed Aral. Their disappearance seems to have been contemporaneous with the desiccation of the Oxus branch of the Caspian, at an epoch when those irruptions of Mongol hordes from the north-east were taking place, which swept away early Central Asian civilisation, and which subsequently caused the destruction of the Greco-Bactrian Monarchy. Whether this ruin of ancient social culture was accompanied by the destruc-

tion and wreck of a system of hydraulic works which were necessary for the cultivation of the soil, is a question whose answer possibly bears very nearly on the causes of the desolation which Nature now wears in the countries of Western Turkestan.

HERBERT WOOD

THE COMMONS EXPERIMENTS ON ANIMALS BILL

THE Bill for the prevention of cruelty in experiments on animals, made for the purpose of scientific discovery, prepared and brought forward by Mr. Lyon Playfair, Mr. Spencer Walpole, and Mr. Evelyn Ashley, is of a very different character from that introduced by Lord Hartismere in the House of Lords and commented on in our last issue (NATURE, vol. xii. p. 21). In it no legislative interference is proposed in the case of operations performed for scientific purposes under the influence of anæsthetics, provided that the insensibility is continued throughout the experiment; immediately after which the animal is to be killed if it has been in any way seriously injured. In the case of operations performed on animals in which it is impossible to employ anæsthetics, it is proposed that those who wish to conduct them shall be required to obtain a license authorising their undertaking them, to obtain which from the Secretary of State a certificate must be produced signed by one at least of the following persons, *viz.*: the President of the Royal Society, or the Presidents of the Royal Colleges of Physicians or Surgeons of London, Edinburgh, or Dublin; and also by a Professor of Physiology, Medicine, or Anatomy in Great Britain. In the case of the applicant being himself one of the just-named professors, or an authorised lecturer on the same subjects, such a certificate is not to be required, but in its place his application would have to be signed by the registrar, president, principal, or secretary of the university or college with which he is connected. The license requires renewal each five years, except in the case of professors, with whom it lasts during their tenure of office. It extends to any person assisting the holder of the license, provided that the person assisting acts in the presence and under the direction of the holder of the license.

The penalty proposed for any contravention of the Act is a fine not exceeding fifty pounds, or imprisonment for a term not exceeding three months.

The whole tenour of this Bill is so much in accordance with our own feelings that we can say nothing against it. Physiological operations on the lower animals, when conducted under the full influence of anæsthetics, cannot shock the most sensitive-minded; and supposing the Bill passes, it will be in the power of all to see that nothing of a painful nature is undertaken. No definition of what is meant by pain is given, it is true; and the only improvement we can suggest is that one be added which prevents the employment of curare as an anæsthetic until its pain-killing power is demonstrated.

BALLOONING AND SCIENCE

THE number of aëronautical ascents in France has been greatly increased since the *Zenith* catastrophe attracted public notice to aerial questions. On Sunday, the 9th of May, not less than three different balloons went up in different places.

These ascents took place at Ivry, close to Paris, at 5.30, at Nantes at 5.40, and at Algiers at 3.45. In the three cases the balloonists experienced a change in the direction of the wind, varying greatly with altitude. The general direction of the Nantes balloon was south-east. The Paris balloon had a less velocity with a greater number of circuits, having ultimately run a distance of ten miles in two hours. The greatest velocity of the air was in close vicinity to the earth; this is an indication of a special current probably pro-

* See NATURE, vol. xi. p. 231.

duced by the warming action of the sun on the solid surface exposed to its rays. These special currents, although somewhat dangerous in making a descent, die out at an altitude of a few hundred feet. The superficial current experienced in the Algiers ascent was running eastwards, and was really a marine current produced by the vicinity of the sea. A peculiarity of this ascent was the presence of a fog, observed at a certain distance above the earth, in air which was coming from the water and had been rendered humid when crossing the Mediterranean Sea. The thermometer, which was only 23° centigrade on the ground, ascended gradually to 25° , and gave 38° and 40° when the balloon had traversed the fog. The maximum observed was 43° at a small altitude.

Clouds do not always prevent the rays of the sun from warming the atmosphere below to a certain extent. In an ascent executed at Avignon (Vaucluse) on the 6th, the thermometer exhibited a warming effect of 5° C., although the balloon had not passed through the clouds, which were at an elevation of more than 4,000 feet.

I do not think we should depend entirely for our knowledge on such points to elaborately organised ascents. As much of our knowledge of the sea has been obtained from the log-books of trading vessels, so by a little good management on the part of aeronautical societies, much important information concerning the atmosphere might be collected from balloonists who make ascents either for purposes of pleasure or profit.

W. DE FONVIELLE

NOTES

M. ANDRÉ, the head of the French Transit Expedition to New Caledonia, has arrived in Paris. His account of the observations will be read to the Academy on Monday week. Dr. Janssen is not expected to arrive in Paris before the 10th of June.

DR. HOOKER was present at Monday's sitting of the Paris Academy of Sciences, of which he is a correspondent in the section of Botany. M. Frémy, the president, noticed the fact, and Dr. Hooker was warmly received by all present.

WE remind the Fellows of the Royal Society of the Reception on the 26th inst., at their rooms in Burlington House, to which they have been invited.

INFORMATION has been received at the Admiralty, by telegram, stating that the *Challenger* will not visit Vancouver Island as intended, but will proceed to Nagasaki, Honolulu, and Valparaiso. Letters should be addressed to Honolulu until the middle of July, and after that date to Valparaiso.

THE French Aéronautical Society has elected for its president M. Paul Bert, the physiologist, who recently organised the fatal *Zenith* expedition. M. Bert has never ascended in a balloon, and has refused several times to do so. M. Tissandier, who had experienced so narrow an escape in the *Zenith*, was appointed one of the vice-presidents.

THE Spectacle Makers have resolved to confer the freedom of their Company on Sir George B. Airy, K.C.B., F.R.S., &c., Astronomer Royal.

WE learn from the Australian papers that an expedition for the exploration of New Guinea is being fitted out by Mr. Macleay, a wealthy citizen of Sydney. Important scientific results are expected to be gathered by this expedition, and Mr. Macleay is worthy of praise for devoting his wealth to so important an object. Notwithstanding that so many explorers are and have been on the island, there is a great deal yet to be done ere we can have anything like an adequate knowledge of its people, its physical condition, and natural history. We hope Mr. Macleay's expedition will attack a part of the island not hitherto explored, and add much that is new and valuable to our knowledge of a country so interesting in itself and in relation to the past of Australia.

THE Swedish Arctic Expedition to Novaya Zemlya, which will start at the beginning of next month from Tromsöe, will be occupied first with botanical, geological, and ethnological inquiries in the southern part of Novaya Zemlya, and then advance along the west coast to the northern point, which it expects to reach about the middle of August. Thence it will go to the north-east to explore this still quite unknown part of the Polar Sea, and then southwards to the mouths of the Obi and the Jenisei, where the country is geologically very interesting. If the ice creates no obstacles, Prof. Nordenskjold will here quit the vessel, and go in a boat up the river, to return home afterwards by land.

THE February number of the *Proceedings* of the Asiatic Society of Bengal contains the President's Address. Colonel Hyde, among other important and interesting topics, refers to the scheme for providing Calcutta with a Zoological Garden, which, through various untoward circumstances, has been hitherto frustrated. The value of such an institution in Calcutta, if put on a rational footing, both to the European and native communities as well as to science, is undoubted, and we hope with Colonel Hyde that the scheme will have the attention both of the Imperial and Local Governments. Indeed, we believe that the Lieutenant-Governor of Bengal has taken up a piece of land suitable for the purpose. The question of the establishment of a Zoological Garden at Calcutta has been before the public and the Asiatic Society from time to time during the last thirty-five years, and it does seem strange that the capital of India should have been so long without such an institution.

ANOTHER subject referred to by the President in the above address is that of earth-current measurements, a committee in connection with which has been appointed at the suggestion of Mr. Schwendler. Considering the very great importance of research in this direction, "there can be no doubt," to quote the *Calcutta Englishman*, "that the Government of India would be fully justified in promoting the undertaking, just as it has assisted the observations of the Transit of Venus, of eclipses, and of meteorological phenomena."

AN unprecedented contest has taken place at the Académie Française in filling the seat vacated by the recent demise of M. Guizot. After four scrutinies, the election was postponed for six months. M. Dumas, the perpetual secretary of the Academy of Sciences, was a candidate, and had as an opponent M. Jules Simon, the former Minister of Public Instruction, an influential member of the Academy of Moral Sciences. But a third candidate, M. Laugel, the scientific reviewer of the *Temps*, and the private secretary of the Duc d'Aumale, having been proposed by his patron and voted by him throughout the four scrutinies, no result could be obtained, the nominations being only made on an absolute majority. M. Laugel has written a few philosophical essays on scientific matters, and is a man of knowledge, but is not known except to a limited circle of friends.

IT is said that thirty young Chinese belonging to influential families are expected very shortly in Paris, where they are to be educated. They are under the care of a French naval officer, who, having joined the Chinese navy, has been appointed Director of Fow-chow Arsenal.

M. LEVERRIER has presented to the Academy of Sciences the observations on the transits of small planets made during the last three months at Greenwich and at Paris: the two Observatories are working conjointly in this department. Observations, limited to those asteroids which are near their apposition, have been made on twenty-two small planets; but the weather was so bad at both Observatories that only sixty-nine observations are recorded, sixty at Paris and nine at Greenwich. Generally the proportion is greater in favour of English observers, but the clouds were dreadfully against them during the last quarter.